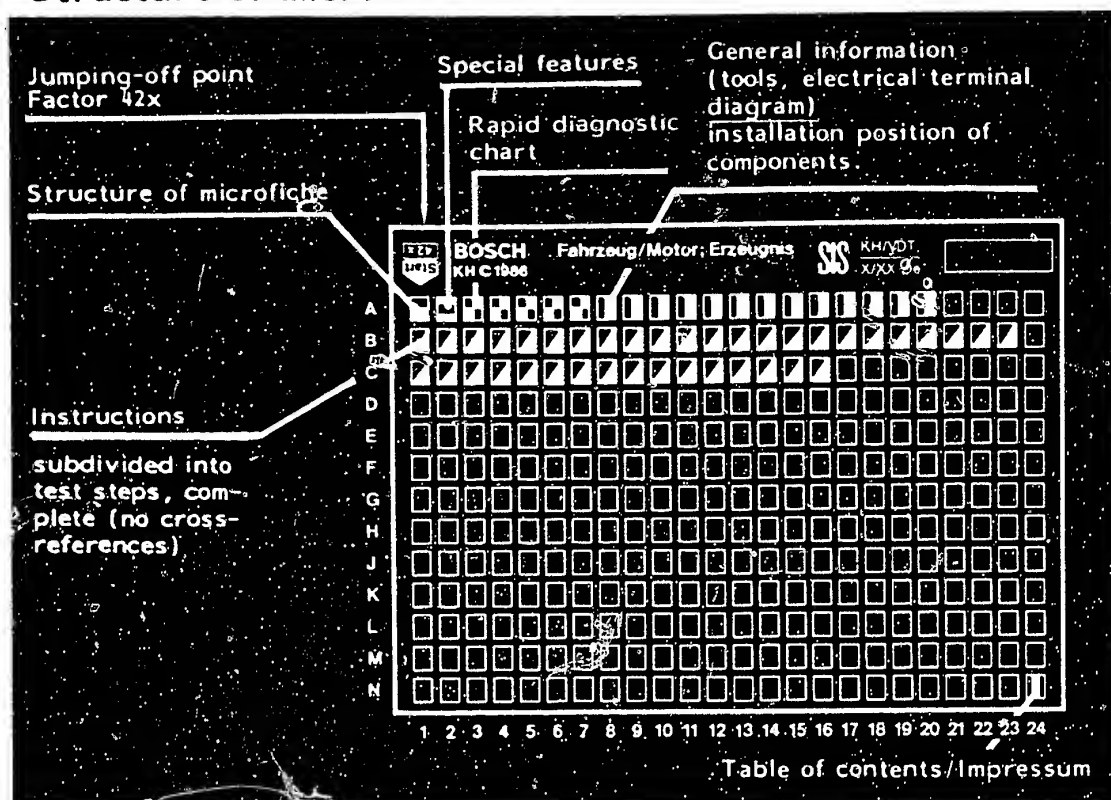


Structure of microfiche

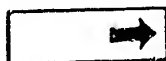


1. Read from left to right
2. Title of microfiche (appears on each coordinate)

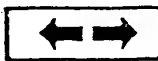
E16	Product/component/test step
	Vehicle/engine

Coordinate

3. Limits of section



Beginning



Mid-section



End



One-page section

4. References to relevant test steps in test specifications; coordinate e.g. C6

C6

A1

Trouble-shooting program



1. Special features

Repair and test instructions with test specifications for BMW 518, 518i - 238i as of 6.8l with heating control and air conditioning.

As of 9/86, vehicles with air conditioner are additionally equipped with a time-delay circuit for compressor actuation.



2. Rapid test chart for heating and air-conditioning test adapter

The following rapid test chart makes it possible for the experienced expert to quickly check the system with the test adapter KDHK0001.

The contents of this chart are limited to the following:

- Sequence of test steps
- Switch position on adapter
- Test instructions and test specifications (readings on adapter)
- References to coordinates of the respective detailed testing and trouble-shooting program.

If detailed information and instructions are required, always proceed in accordance with the trouble-shooting program starting on Coordinate B1.

Test conditions

- Check the customer complaint
(Check operation of heating/air-conditioning control in accordance with vehicle owner manual).
- Engine running and at normal operating temperature.
- Electrical system (fuses, battery voltage) O.K.
- Blower switch at position III/blower running at max. speed.
- Sliding lever set to max. windshield defrost.



Rapid test chart for electronic heating control (test must also be performed on vehicles with air conditioner)

Test adapter KDHK 0001 with adapter lead KDHK 0002

Test step	Rotary switch position	Test of	Test instructions	Reading/ test specification	Coordinate
1	1	Supply voltage	Vehicle with air conditioner: air-conditioning switch in "heating control" position	10 ... 15	B 4
2	2	Passenger-compartment temperature sensor		5 ... 11	B 6
2.1			(Only in vehicle with air conditioner) air-conditioning switch in air-conditioner position (Lamp in air-conditioning switch lights up). After testing, return air-conditioning switch to heating control position.	Slowly rising	B 8
2.2			Spray refrigerant spray into passenger-compartment temperature sensor	Falling during cooling down	B 10
2.3			With engine running, check flow of air to temperature sensor (with strip of paper).		B 12
3	3	Air-conditioning switch	(Only in vehicle with air conditioner) air-conditioning switch in "air conditioner" position (Lamp in air-conditioning switch lights up)	10 ... 15	B 14
3.1			Air-conditioning switch in "heating control" position	0	B 16
4	7	Hot-water valve	Switch on auxiliary switch (S) on test adapter No heating effect - check by feeling	0 ... 3	B 18
4.1			Switch off auxiliary switch (S) on test adapter Heating effect - check by feeling	9 ... 14	B 20
5	8	Temperature sensor on heat exchanger	Test step to come directly after 7.1 (water in heat exchanger must be hot at start of test).	7 ... 12 Slowly falling	B 22

A4

Rapid test chart
BMW



A5

Rapid test chart
BMW



Rapid test chart only for air conditioner (test not applicable to vehicles only with heating control)

Test adapter KDHK 0001 with adapter lead KDHK 0003

Test step	Rotary switch position	Test of	Test instructions	Reading/test specification	Coordinate
6	1	Supply voltage	Air-conditioning switch in "heating control" position	0	C 4
6.1			Air-conditioning switch in "air conditioner" position Evaporator blower running	10 ... 15	C 6
7	2	Evaporator temperature sensor, compressor clutch		5 ... 12	C 8
7.1			Press push-button (T) on test adapter (approx. 10 seconds) Refrigerant compressor running	Slowly falling	C 10
8	3	Rotary temperature switch	Slowly turn rotary temperature switch from 16 to 32	0 ... app. 7 uniformly rising	C 12
9	4	Switch-on delay for refrigeration compressor	Press button (T) on test adapter	10 ... 15	C 14

A6

Rapid test chart

BMW



A7

Rapid test chart

BMW



3. General introduction

There are various heating/ventilation systems for the 5 series. The basic model, the BMW 518, has a water heating control.

A water-side electronic heating control has been included in models 518i through 528i, 524 tD, and 518 as optional equipment (SA).

With the "rotary temperature switch" it is possible to set the desired "temperature" in the electronic control unit. Once set, the "temperature" is held constant largely independently of driving speed and engine speed. During the heating-up process after cold-starting the temperature setting need not be changed since the automatic heating control ensures the fastest possible heating up of the passenger compartment until the set "temperature" is reached.

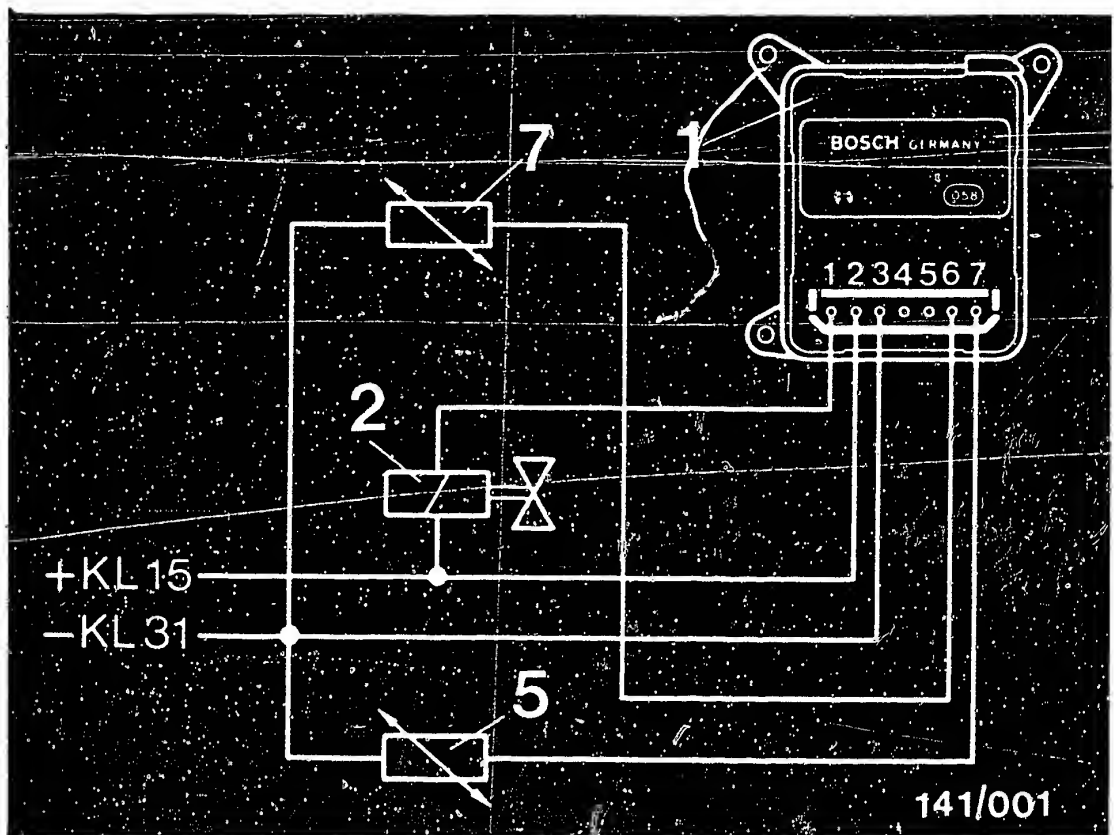
The automatic heating control consists of a control unit built on behind the "rotary temperature switch", a temperature sensor in the instrument panel trim at the bottom left, for measuring the passenger-compartment temperature, and a sensor under the heat exchanger in the heater unit (on left-hand side behind centre console) which records the temperature of the hot air. The hot-water valve in the hot-water flow (engine compartment) is energized depending on the temperatures at the sensors and the setting of the rotary temperature switch. The solenoid-operated valve has no intermediate positions and is either open (deenergized) or closed. It is actuated electrically by the control unit.



An optional extra for all models is an air conditioner which is coupled to the ventilation system. With the air conditioner optional extra the BMW 518, as well as the vehicles 520 i - 528 i is provided with the automatic heating control. The cooled air is then distributed via the manually controllable side and centre grille as well as via an indirect, upward-directed centre grille.

As of 9/86 a time-delay circuit is included for triggering compressor coupling. The time delay prevents the reclosing of compressor coupling for about 10 sec. after pressure-switch response.

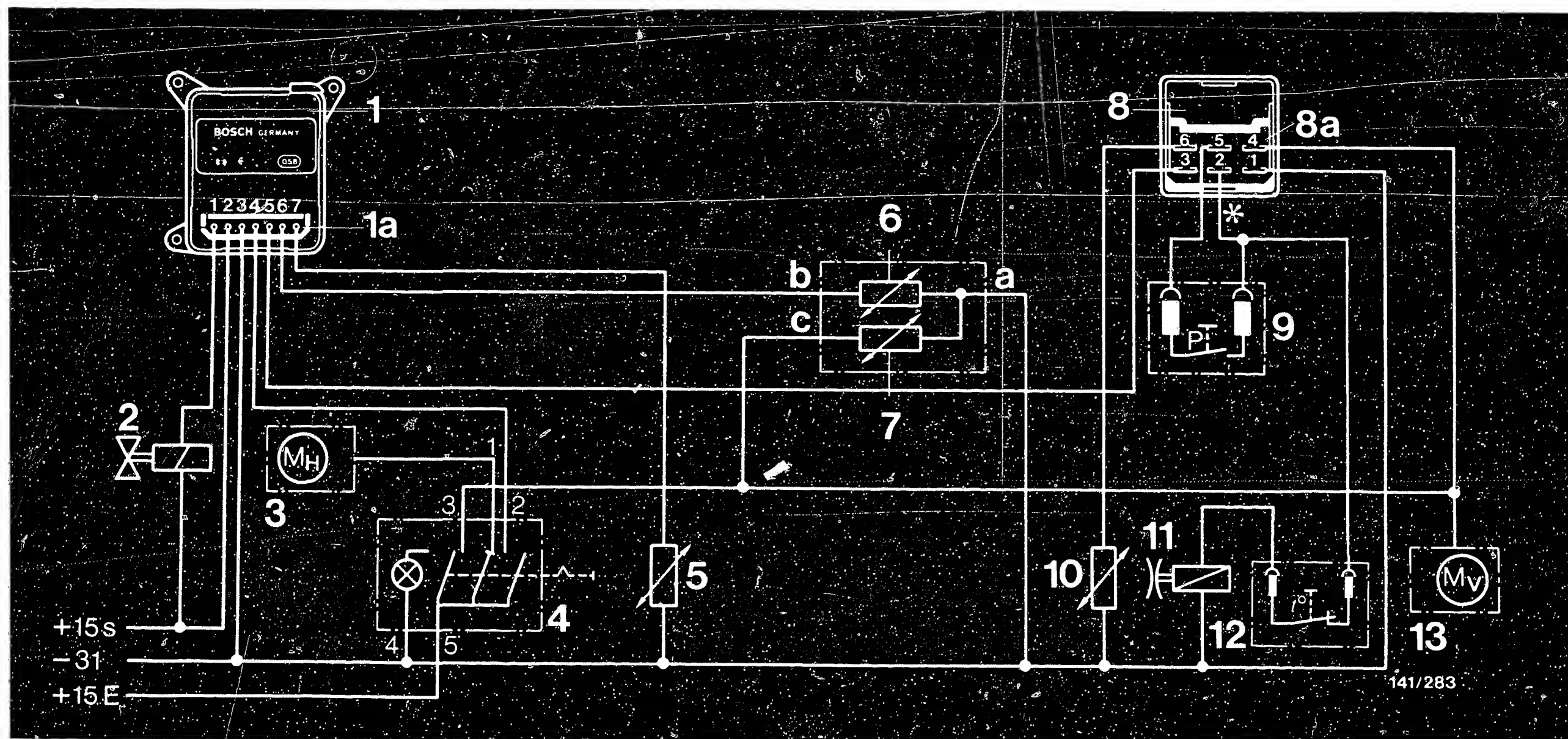




4. Basic circuit diagram of heating control

- 1 = Electronic trigger box - heating control
- 2 = Hot-water valve
- 5 = Temperature sensor on heat exchanger
- 7 = Passenger-compartment temperature sensor





4.1 Basic circuit diagram of heating control and air conditioner

- 1 = Electronic trigger box - heating control
- 1a = Trigger-box plug - heating control
- 2 = Hot-water valve
- 3 = Heating blower
- 4 = Air-conditioning switch
- 5 = Temperature sensor on heat exchanger
- 6 = Passenger-compartment temperature sensor
- 7 = Heating resistor in passenger-compartment temperature sensor

- 8 = Electronic trigger box - air conditioner
- 8a = Trigger-box plug - air conditioner
- 9 = Pressure switch, refrigeration compressor
- 10 = Evaporator temperature sensor
- 11 = Compressor coupling
- 12 = Temperature switch
- 13 = Evaporator blower
- +15s = From fuse

+15E = From relief relay
(located in fuse box)

-31 = Ground

* As of 9/86 additional lead for delay circuit

A11

Basic circuit diagram of air conditioner

BMW



A12

Basic circuit diagram of air conditioner

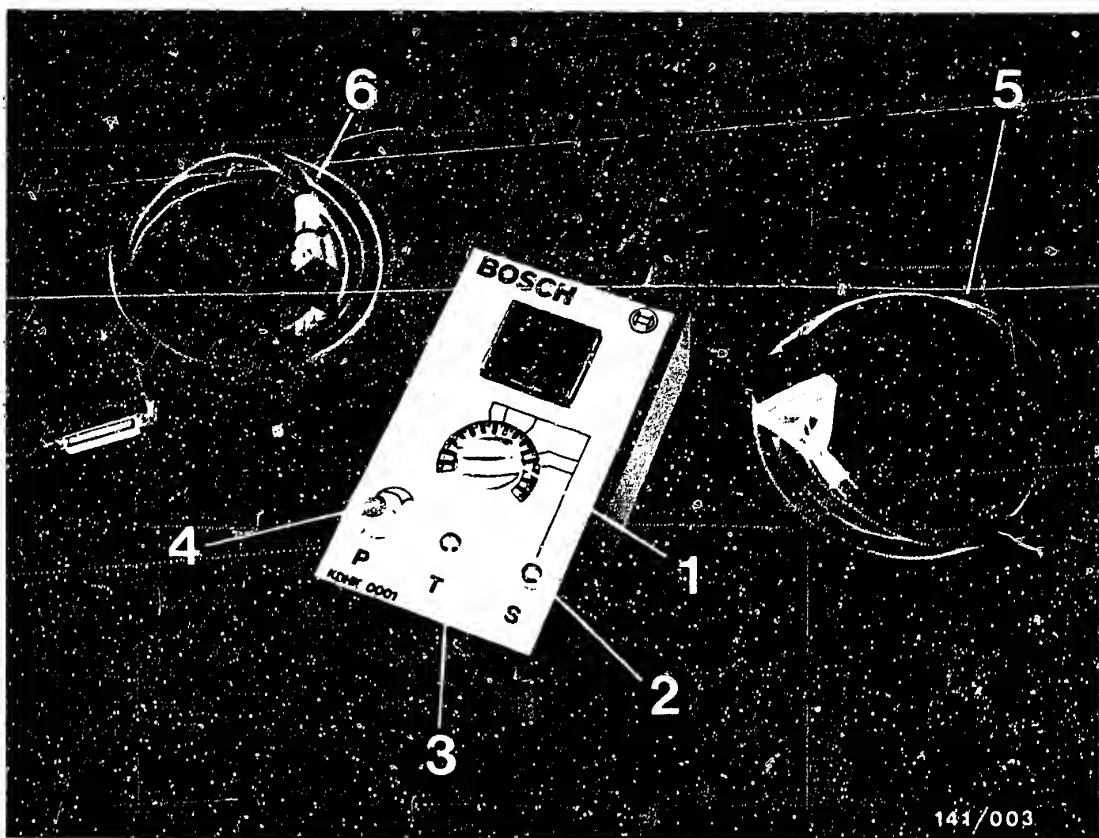
BMW



5. Testers and tools

Heating and air-conditioning test adapter	KDHK 0001
Adapter lead (heating control)	KDHK 0002
Adapter lead (air conditioner)	KDHK 0003
Multimeter ETE 014.00	0 684 101 400
or e.g. Pontavi	Commercially available
Refrigerant spray	Commercially available





5.1 Heating and air-conditioning test adapter (KDHK 0001)

- 1 = Rotary switch (S1)
- 2 = Auxiliary switch (S)
- 3 = Push-button (T)
- 4 = Potentiometer (P)
- 5 = Adapter lead (KDHK 0002) for BMW heating regulator
- 6 = Adapter lead (KDHK 0003) for BMW air conditioner

Both adapter leads are required for the air conditioner.



Explanatory notes on the heating and air-conditioning test adapter KDHK 0001

The heating and air-conditioning test adapter is used for checking the peripherals on heating control/air-conditioning systems. The electronic control units are not tested using this adapter.

Construction

The test adapter is constructed so that, using the rotary switch (S1), the individual components as well as the electric leads are switched on and/or tested one after the other.

Using the auxiliary switch (S), a certain component group can be checked for 2 different functions.

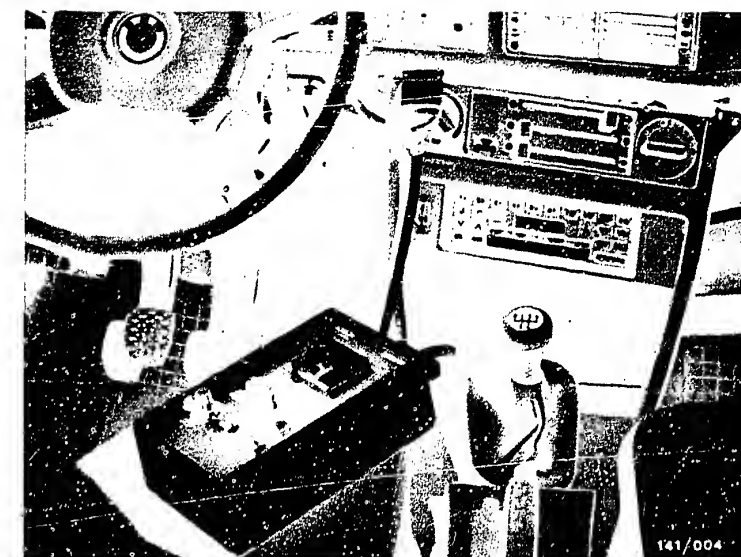
Push-button (T) is used for the brief switching on of the compressor.

The potentiometer (P) is not needed for BMW heating and air-conditioning systems.

Two adapter leads are available for checking the heating and air-conditioning system:

For vehicles with heating control (Fig. 1) adapter lead KDHK 0002,

For vehicles with heating control and air conditioner (Fig. 2) adapter lead KDHK 0002 and KDHK 0003.



Vehicles with heating control

Vehicles with heating control and air conditioner



A15

Heating and air-conditioning test adapter

BMW



A16

Heating and air-conditioning test adapter

BMW



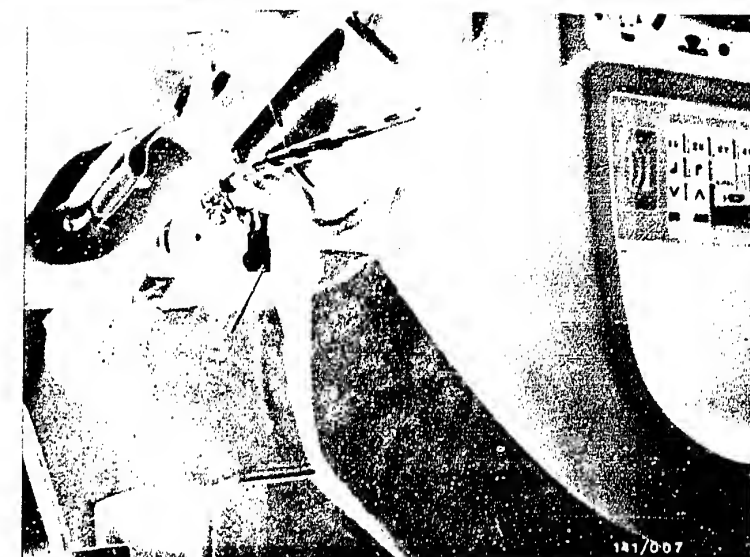
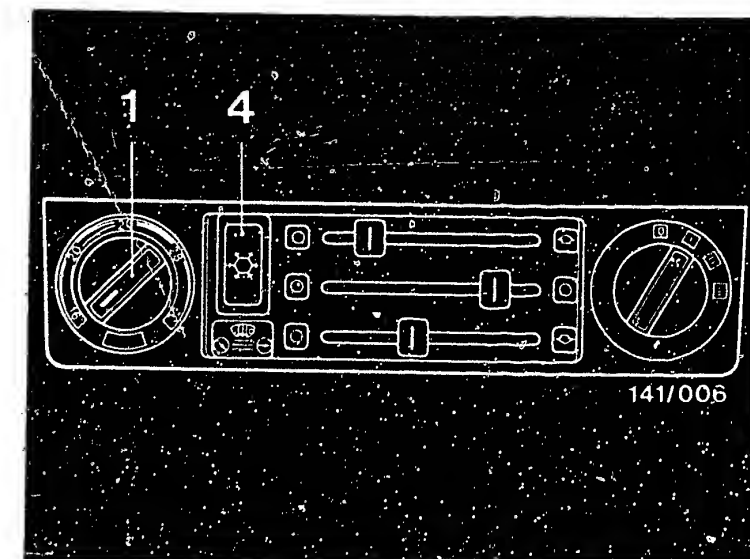
6. Installation position of components

The electronic heating regulator is located in the centre console directly behind the rotary temperature switch (1).

The air-conditioning switch (4) is located on the right of the rotary temperature switch (is not supplied by Bosch).

The temperature sensor on the heat exchanger (5) is located on the left-hand side in the heater unit.

The passenger-compartment temperature sensor (6) is built into the bottom of the left-hand footwell trim.



A17

Installation position of components

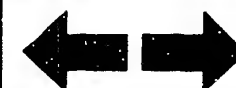
BMW



A18

Installation position of components

BMW

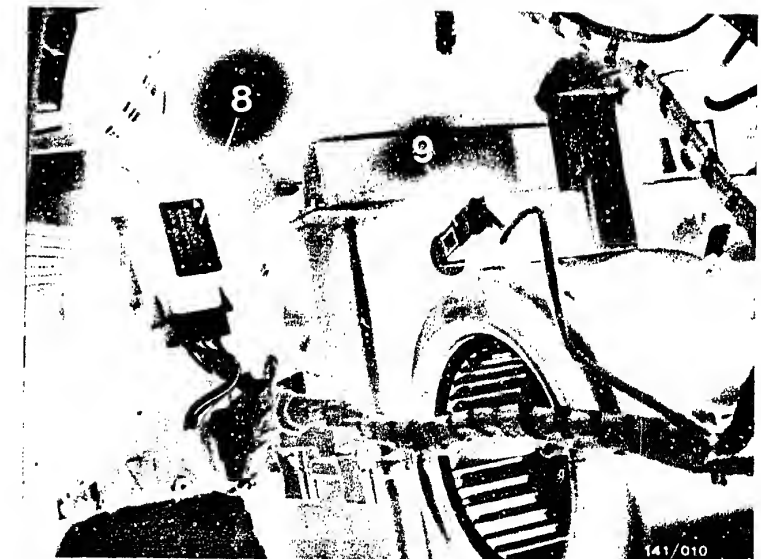


Installation position of components (continued)

The hot-water valve (2) is positioned in the engine compartment on the left-hand side on the firewall.

The electronic control unit - air conditioner (8) is mounted under the left-hand footwell trim near the heater unit.

The evaporator temperature sensor (9) for the air conditioner also protects against icing up. It is plugged at a downward angle into the evaporator housing.



A19

Installation position of components

BMW



A20


Installation position of components

BMW



7. Trouble-shooting according to test steps

7.1 Test conditions

- Check the customer complaints
(Check operation of heating/air-conditioning control in accordance with vehicle owner manual).
- Engine running and at normal operating temperature.
- Electrical system (fuses, battery voltage) O.K.
- Blower switch at position III/blower running at max. speed.
- Sliding lever set to max. windshield defrost 

Notes

In the detailed trouble-shooting starting on Coordinate B1, go through the test steps one after the other. Only if a malfunction is indicated, proceed with the trouble-shooting which is set out underneath the test steps.



7.2 Connection of adapter lead

In vehicles with heating control:

Switch off ignition. Remove left-hand footwell trim. To do this, loosen 5 screws (arrows Fig. 1).

Unclip passenger-compartment temperature sensor.

Remove shift lever boot from the top.

Lift out ashtray from the top.

Loosen 5 centre console fastening screws (arrows Fig. 2). Force centre console forward. Pull upward the hand-brake lever trim and place on centre console. Pull centre console to the rear.

Remove trigger-box plug from heating regulator and connect to test adapter KDHK 0001 by means of adapter lead KDHK 0002. Start engine.

In vehicles with heating control and air conditioner:

Switch off ignition. Remove left-hand footwell trim. To do this, loosen 5 screws (arrows Fig. 1).

Unclip passenger-compartment temperature sensor.

Lift out ashtray from the top.

Remove shift lever knob and shift lever boot. Loosen 5 centre console fastening screws (arrows Fig. 3).

Force centre console to the front and lift over hand-brake lever trim.

Loosen 2 fastening screws at top and 2 fastening screws on side of centre console (arrows Fig. 3).

Remove electrical connections from cig. lighter and switch for power-operated windows.

Remove complete centre console without radio and heating control section.

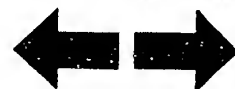
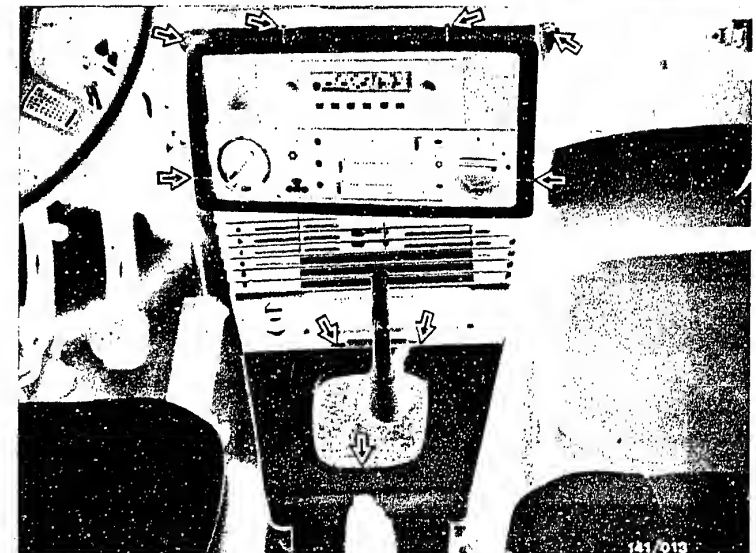
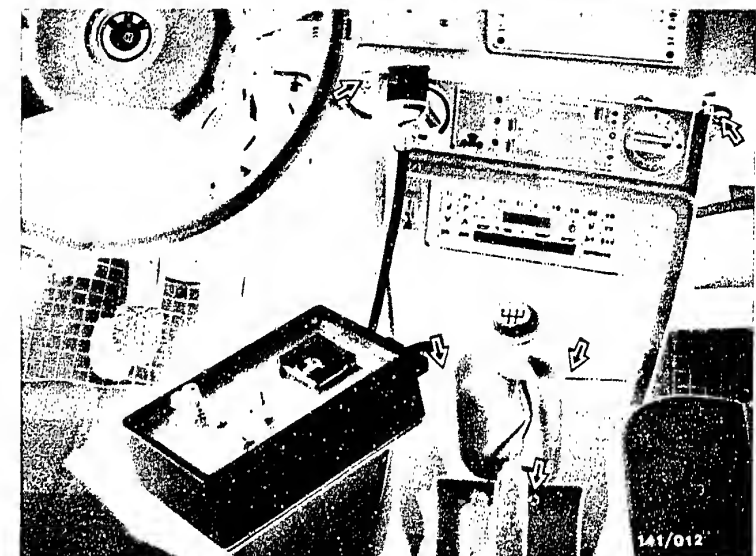
Remove trigger-box plug from heating regulator and connect to test adapter KDHK 0001 by means of adapter lead KDHK 0002.

Start engine.

Note

Carry out the trouble-shooting with the aid of the test chart.

If the connection between trigger-box plug and adapter lead or adapter lead and test adapter becomes undone, always first of all set the rotary switch on the test adapter to "0" and switch off the ignition.



Test step 1

Operation:
Rotary-switch position (S1): 1

Measuring equipment:
Test adapter KDHK 0001

Measuring range:
0...15

Operation in vehicle:
Engine running

Reading on test adapter:
10...15

Subject of testing:
Voltage supply, control unit for heating control

Is test specification reached?

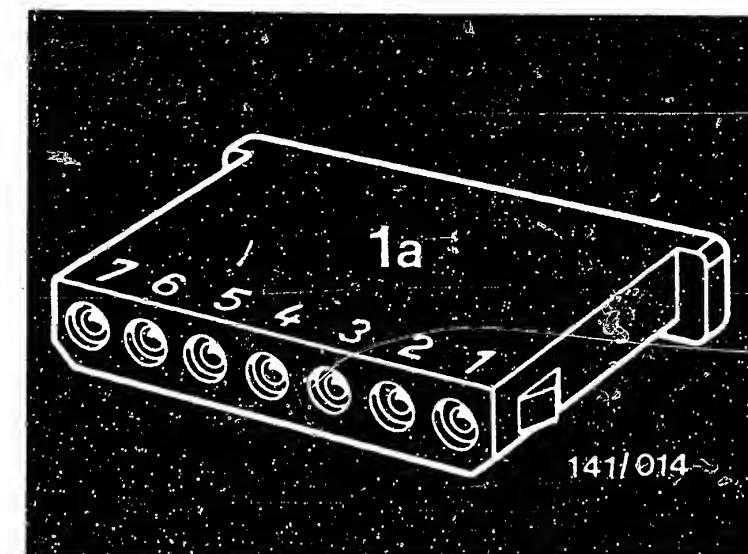
no

Trouble-shooting with multimeter:

Using voltmeter, test socket 3 to socket 2 on control-unit plug (1a):
Reading: approx. U_B
(ignition switched on)

Reading not U_B :

Check fuses.
Eliminate open circuits or contact resistances in leads. If reading is greater than U_B , the generator regulator is defective.



1a = Control-unit plug

yes

Continued on next page

B4

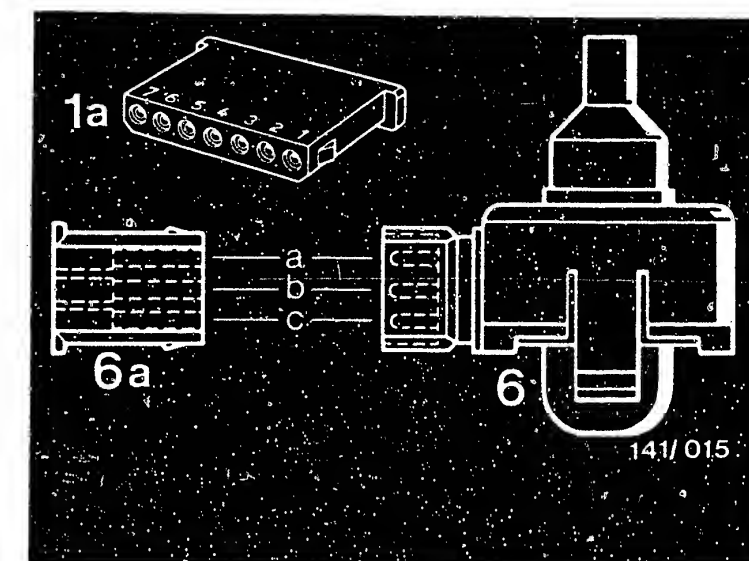
Trouble-shooting
BMW



B5

Trouble-shooting
BMW





6 = Interior temperature sensor
 6a = Plug for interior temperature sensor
 1a = Control-unit plug

Test step 2

Operation:

Rotary-switch position (S1): 2

Measuring equipment:

Test adapter

Measuring range:

0...15

Operation in vehicle:

Engine running

Reading on test adapter

5...11

Subject of testing:

Resistance of interior temperature sensor

Is test specification reached?

no

Trouble-shooting with multimeter

Switch off ignition.

Using ohmmeter, check following leads for continuity:

- From control-unit plug (1a) socket 3 to temperature-sensor plug (6a) socket "a" -
- From control-unit plug (1a) socket 6 to temperature-sensor plug socket "b" -

Nominal reading approx. 0Ω

- Test for short circuit at control-unit plug (1a) socket 6 to socket 3 (plug disconnected from temperature sensor).

Nominal reading: approx. $\infty\Omega$

Eliminate contact resistances and open circuits in leads. Test resistance of interior temperature sensor between plug pins of temperature sensor:

Nominal reading: approx. 8 ... 16 k Ω
 at approx. +15...30°C at

temperature sensor.

Otherwise replace interior temperature sensor.

yes

Continued on next page

B6

Trouble-shooting

BMW



B7

Trouble-shooting

BMW



Test step: 2.1

Only for vehicles with air conditioning.

Operation:

Rotary-switch position (S1): 2

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

A/C switch in "air conditioner" position.

Engine running.

Reading on test adapter:

Slowly rising

Subject of testing:

Heating resistance in interior temperature sensor

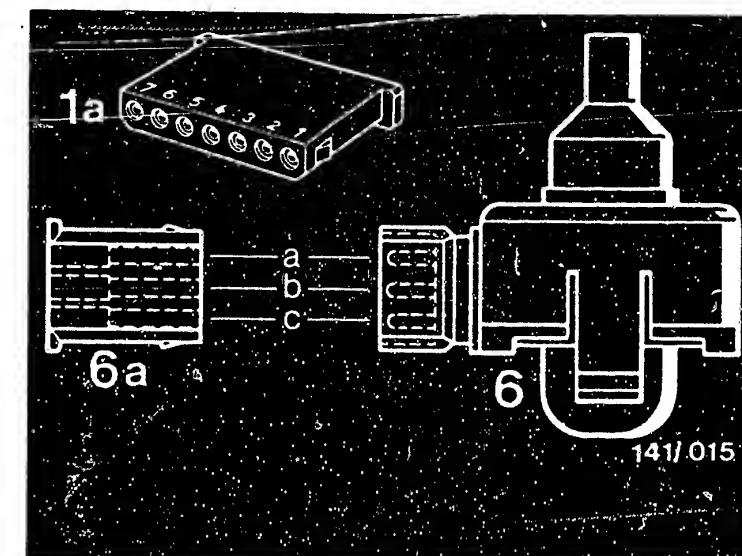
Is test specification reached?

no

Trouble-shooting with multimeter:

Switch off ignition. Test resistance of heating resistor between plug pins a and c. Nominal reading approx. 30 Ω

Test voltage supply between plug pin c and ground. Nominal resistance approx. battery voltage (ignition switched on).



1a = Control-unit plug

6 = Interior temperature sensor

6a = Plug on interior temperature sensor

yes

Continued on next page

B8

Trouble-shooting

BMW



B9

Trouble-shooting

BMW



Test step: 2.2

Operation:

Rotary-switch position (SI): 2

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

Engine running

Additional operation:

Spray refrigerant spray into sensor (upper illustration)

Reading on test adapter:

Slowly falling

Subject of testing:

Interior temperature sensor (change in resistance)

Does reading fall during cooling?

no

Trouble-shooting with multimeter:

Switch off ignition.

Test resistance of interior temperature sensor between plug pins a and b.

Nominal reading: approx. 8 ... 16 k Ω
at approx. +15 ... 30°C at temperature sensor.

Spray interior temperature sensor with refrigerant spray, resistance should rise, if so interior temperature sensor is OK.

Using ohmmeter, test following leads for short and open circuits:

- At control-unit plug (1a) socket 3 to temperature-sensor plug (6a) socket "a"

Nominal reading: approx. 0 Ω

- At control-unit plug (1a) socket 6 to temperature-sensor plug (6a) socket "b".

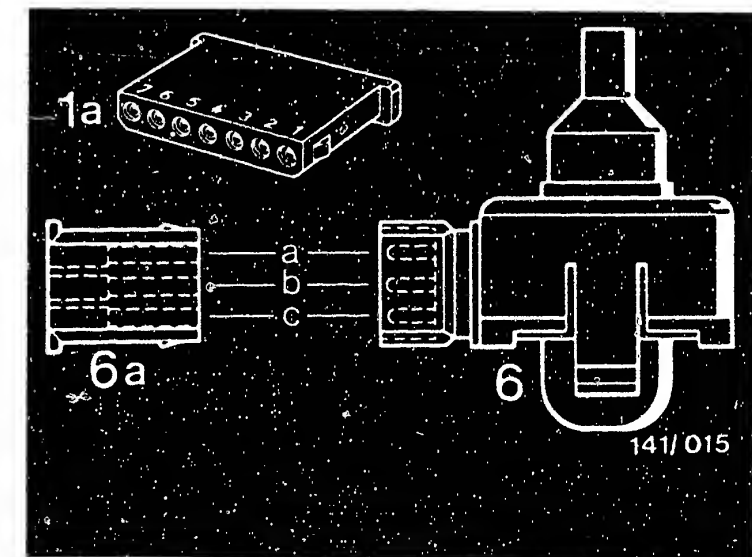
Nominal reading: approx. 0 Ω

Test leads for short circuits: Ohmmeter at control-unit plug (1a) socket 6 to socket 3

Nominal resistance: $\infty \Omega$
(Plug disconnected from temperature sensor).



6 = Interior temperature sensor
6a = Plug for interior temperature sensor
1a = Control-unit plug



yes

Continued on next page

B 10

Trouble-shooting

BMW



B 11

Trouble-shooting

BMW



Test step: 2.3

Operation:

Rotary-switch position (S1): 2

Measuring equipment:

Paper strip or similar

Operation in vehicle:

Engine running

Additional operation:

Hold paper strip in front of
air opening (see upper
illustration).

Reading:

Paper strip is pulled towards
air opening

Subject of testing:

Air induction through air
opening of interior temperature
sensor

Is paper strip pulled towards
opening?

no

Trouble-shooting:

Check vacuum hose between interior temperature
sensor housing and intake manifold for leakage.
Make sure of firm seating.



yes

Continued on next page

B 12

Trouble-shooting

BMW

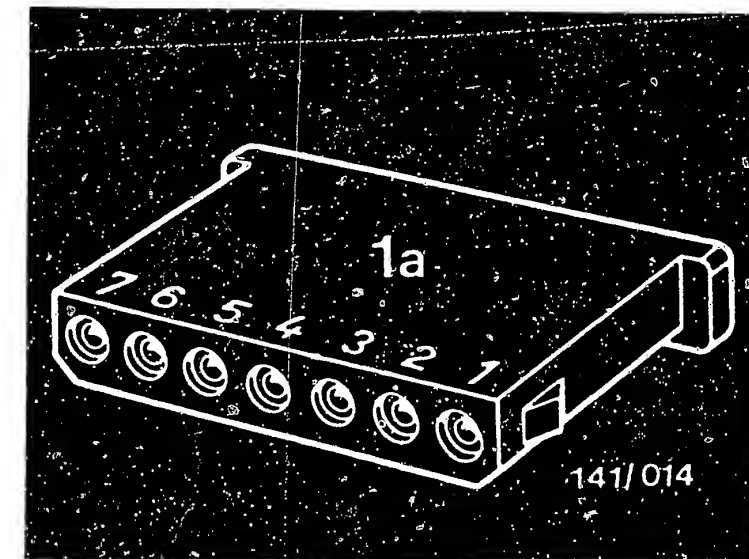


B 13

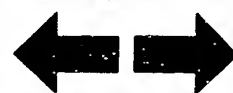
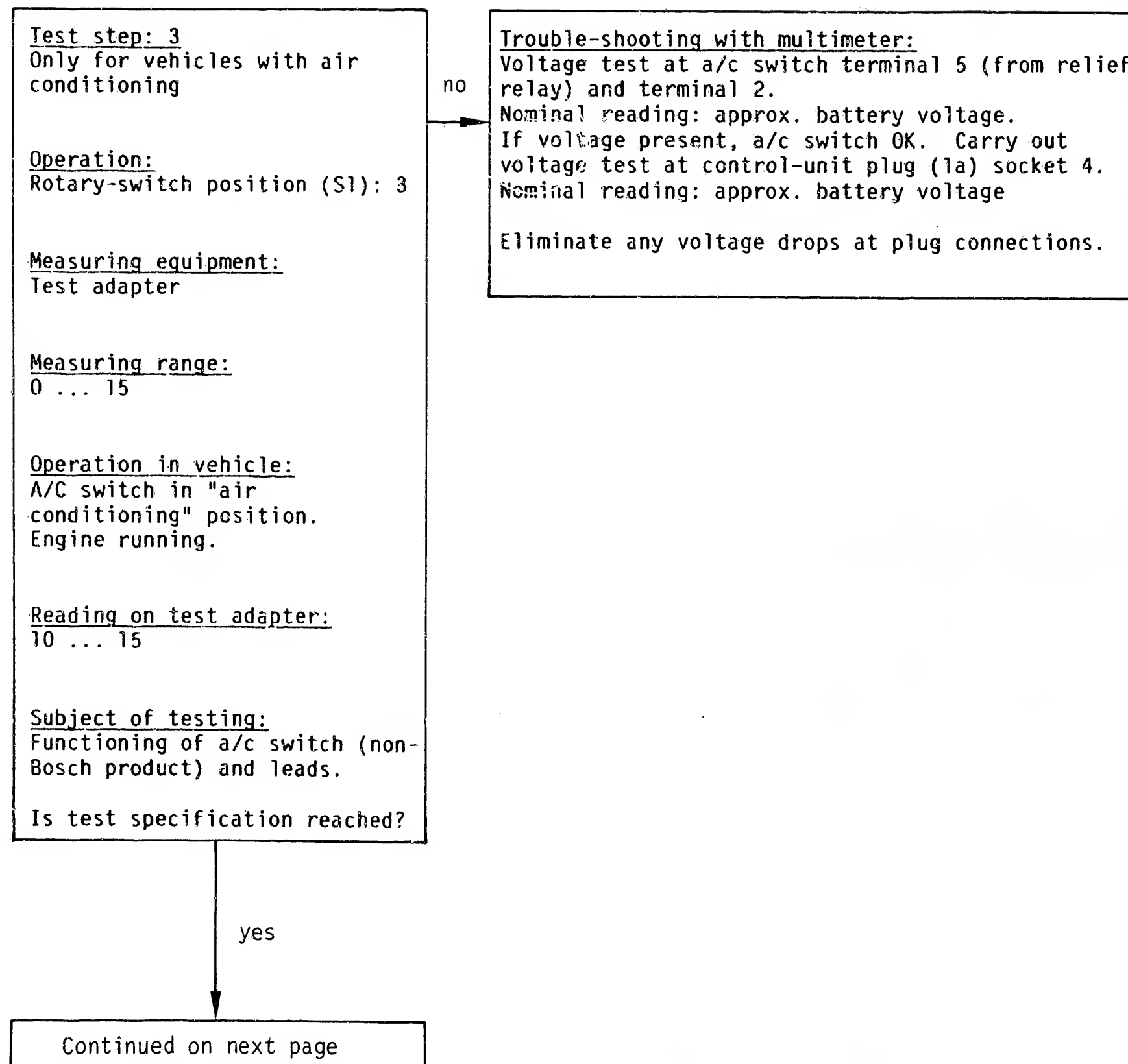
Trouble-shooting

BMW





1a = Control-unit plug



Test step: 3.1

Only for vehicles with air conditioning

no

Trouble-shooting with multimeter:

Using voltmeter, test at a/c switch (4) term. 2 if approx. battery voltage present.
If so, a/c switch defective.

Operation:

Rotary-switch position (S1): 3

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

A/C switch in "heating control" position.
Engine running.

Reading on test adapter:

0 ... 3

Subject of testing:

Functioning of a/c switch (non-Bosch product) and leads.

Is test specification reached?

yes

Continued on next page

B 16

Trouble-shooting

BMW



B 17

Trouble-shooting

BMW



Test step: 4

Operation:

Rotary-switch position (SI): 7

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

Engine running

Additional operation:

Press auxiliary switch "S" on test adapter.

Reading on test adapter:

0 ... 3

Feel to make certain that there is no heating.

Subject of testing:

Operation of hot-water valve, blocking hot-water supply.

Is test specification reached?

No heating effect?

yes

Continued on next page

no

Trouble-shooting with multimeter

Switch off ignition.

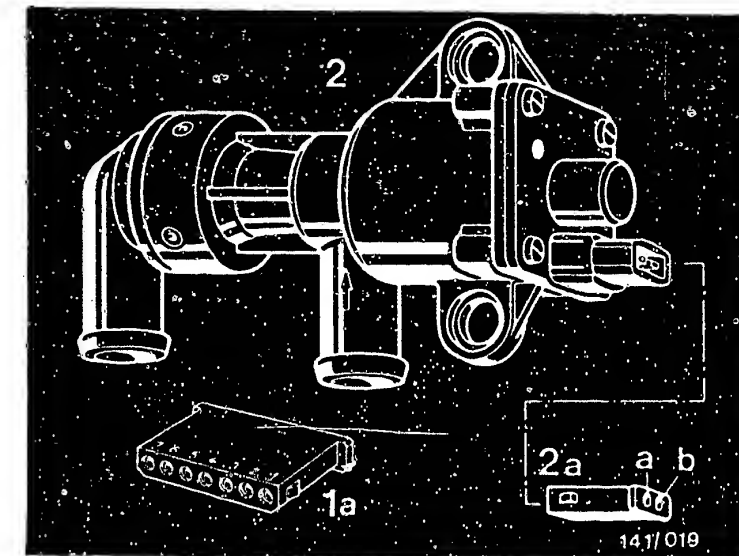
Using ohmmeter, test lead from control-unit plug (1a) socket 1 to hot-water valve plug (2a) socket b.

Reading: approx. 0 Ω

Using voltmeter, test from hot-water valve plug (2a) socket a to ground. Ignition switched on.

Reading: approx. battery voltage

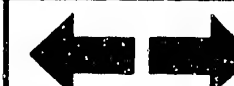
Inspect leads for short circuits. Eliminate open circuits/contact resistances at plug connections. Replace hot-water valve.



1a = Control-unit plug

2 = Hot-water valve

2a = Plug for hot-water valve



Test step: 4.1

Operation:

Rotary-switch position (S1): 7

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

Engine running

Additional operation:

Press auxiliary switch "S" on test adapter once more (disengage).

Reading on test adapter:

9 ... 14

Feel to determine whether there is heating.

Subject of testing:

Hot-water valve.

Hot-water supply opened.

Is test specification reached?

Is there heating?

yes

Continued on next page

no

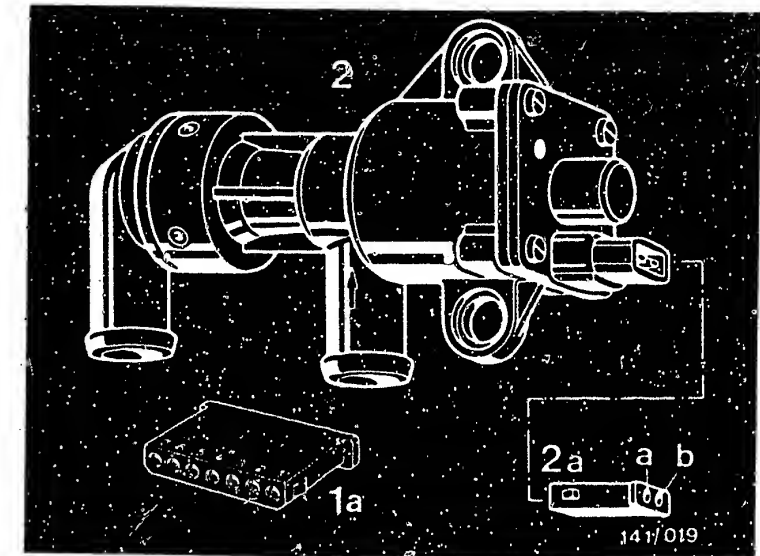
Trouble-shooting

1. No heating effect despite reading 9...14.

Hot-water valve in good electrical order but mechanically defective. Replace.

2. Heating only at very low engine speed. If system heats only at low engine speed, the hot-water valve is defective.

Replace hot-water valve.



1a = Control-unit plug

2 = Hot-water valve

2a = Plug for hot-water valve



Test step: 5

Follows Test step 4.1 without interruption.

Operation:

Rotary-switch position (S1): 8

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

Engine running

Reading on test adapter:

7 ... 12, slowly falling

Subject of testing:

Temperature sensor at heat exchanger.

Change in resistance.

Is test specification reached?
Does reading slowly drop?

yes

Continued on next page

no

Trouble-shooting with multimeter:

Ignition switched off.

Using ohmmeter, test following leads for continuity: From temperature-sensor plug (5a) at heat exchanger socket a to control-unit plug (1a) socket 3.

Nominal reading: approx. 0 Ω

From temperature-sensor plug (5a) at heat exchanger socket b to control-unit plug (1a) socket 7.

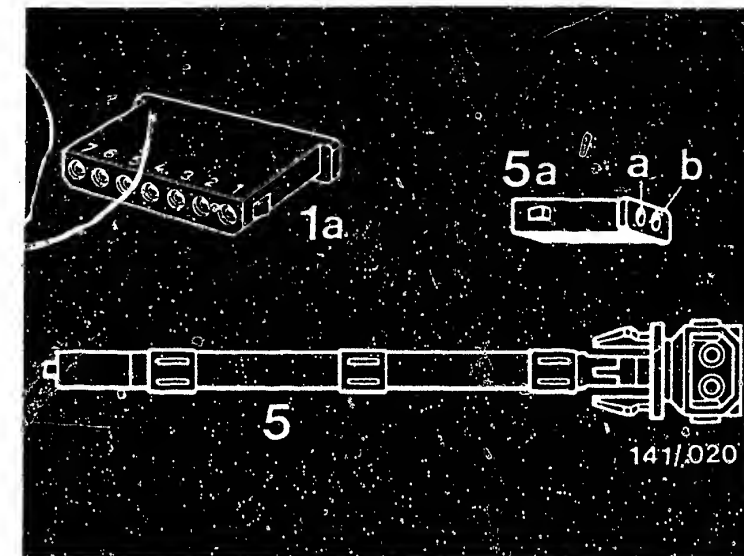
Nominal reading: approx. 0 Ω

Inspect leads for short circuits, using ohmmeter at control-unit plug (1a) socket 3 to socket 7. (temperature-sensor plug (5a) disconnected).

Nominal reading: $\infty \Omega$

Test resistance of temperature sensor. Connect ohmmeter between plug pins of temperature sensor:
Nominal reading: approx. 8 ... 16 k Ω
at approx. +15...+30°C at temperature sensor.

Spray temperature sensor with refrigerant spray. If resistance increases, the temperature sensor is OK.



1a = Control-unit plug

5 = Temperature sensor at heat exchanger

5a = Plug for temperature sensor at heat exchanger



Note:

If reading is not "slowly receding", it may be that the hot water in the heat exchanger has already cooled off too much.

If so, turn rotary switch (S1) on test adapter back to position 7 for at least 15 sec. (auxiliary switch (S) disengaged).

Then continue with Test step 5

Eliminate any open circuits / contact resistances in leads and plug connections. Replace temperature sensor at heat exchanger.

yes

Continued on next page

C1

Trouble-shooting

BMW



C2

Trouble-shooting

BMW



Set rotary switch (S1) on test adapter to "0". Switch off ignition.

Pull adapter cable KDHK 0002 from control-unit plug.

If no fault has been found on the individual components by testing the electrical heating control with the test adapter, but the heating control is still malfunctioning, try replacing the electronic control unit - heating regulator. Plug the trigger-box plug onto the electronic control unit- heating control. Then re-check the system according to the vehicle owner manual.

In the case of vehicles without air conditioner, testing is completed. Re-install centre console, passenger compartment temperature sensor and footwell trim.

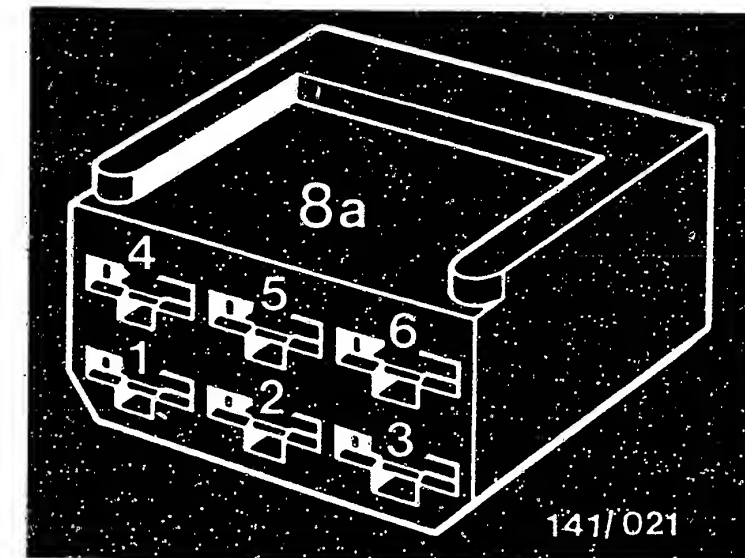
In the case of vehicles with air conditioner:

Connect adapter lead KDHK 0003 to trigger-box plug of electronic control unit- air conditioner and test adapter.

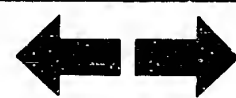
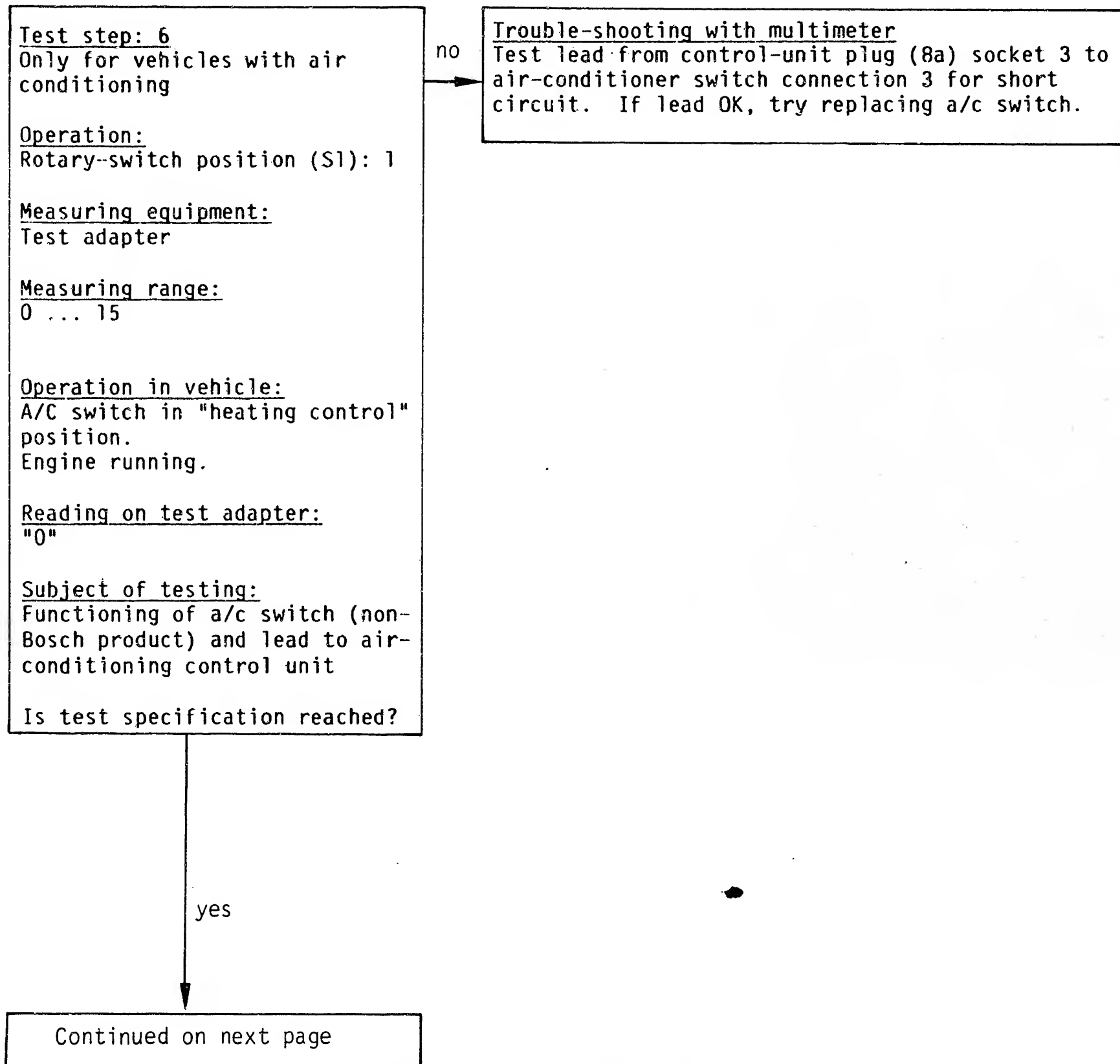
Start engine.

Continue trouble-shooting on Coordinate C 4.





8a = Control-unit plug,
air-conditioning system



Test step: 6.1

Only for vehicles with air conditioning

Operation:

Rotary-switch position (S1): 1

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

A/C switch at "air conditioner" position (evaporator blower must be running).

Engine running.

Additional operation:

Reading on test adapter

10 ... 15

Subject of testing:

Voltage supply, electronic control unit for air-conditioning system

Is test specification reached?

yes

Continued on next page

no

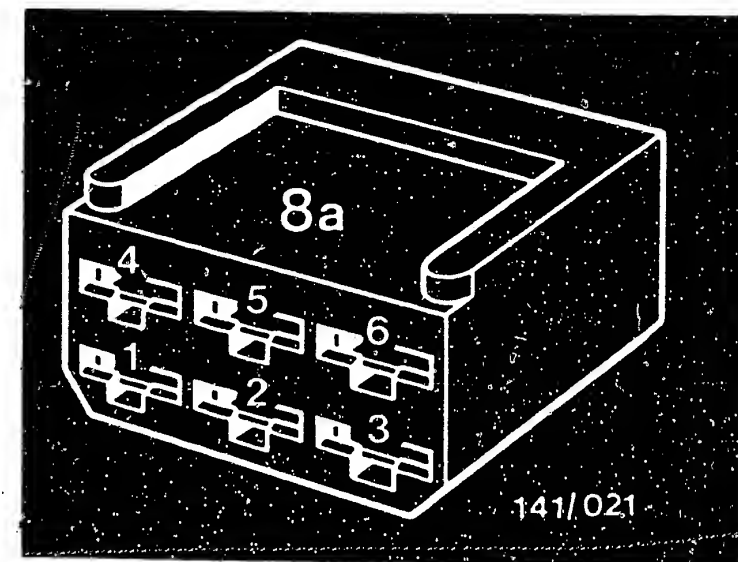
Trouble-shooting with multimeter

Using voltmeter, test whether battery voltage present at a/c switch (4) term. 3 and at control-unit plug (8a) plug socket 3. If not, fuse, a/c switch, or relief relay may be defective, lead may be interrupted, or there may be contact resistance at plug connections.

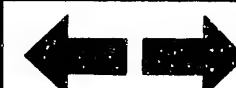
Connect voltmeter between +term. 30 and control-unit plug (8a) plug socket 6.

Nominal reading: approx. battery voltage, if not then ground lead to electronic control unit for air-conditioning system has open circuit (see circuit diagram).

Eliminate contact resistances at plug connections. If reading shows more than battery voltage, generator regulator is defective.



8a = Control-unit plug for air-conditioning system



Test step: 7

Only on vehicles with air conditioning

Operation:

Rotary-switch position (S1): 2

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

A/C switch in "air conditioner" position.

Engine running.

Reading on test adapter:

5 ... 12

Subject of testing:

Temperature sensor at evaporator. Resistance corresponding to evaporator temperature.

Is test specification reached?

yes

Continued on next page

no

Trouble-shooting with multimeter:

Switch off ignition.

Using ohmmeter, check leads for continuity:

From control-unit plug (8a) socket 1 to plug (9a) on evaporator-temperature sensor socket "a".

From plug on evaporator-temperature sensor (9a) socket "b" to ground.

Nominal resistance: approx. 0Ω

Test leads for short circuits:

Connect ohmmeter to plug (9a) of evaporator-temperature sensor between sockets a and b (adapter cable disconnected from control-unit plug).

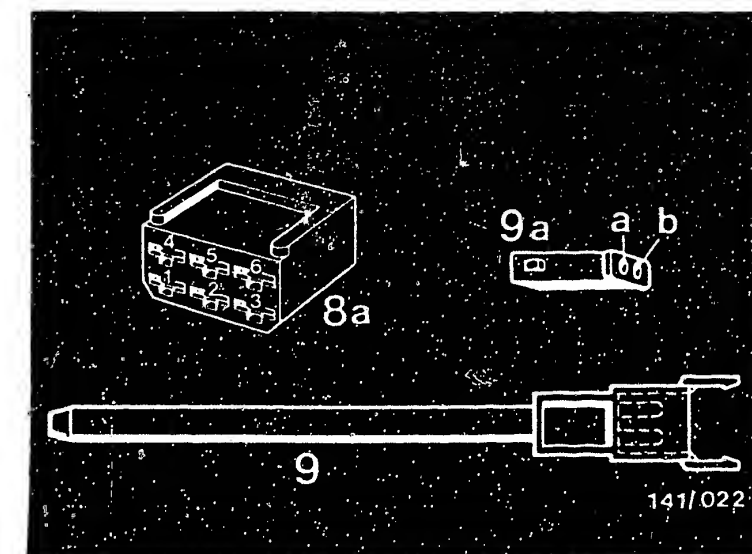
Nominal resistance: approx. $\infty\Omega$

Test resistance of evaporator-temperature sensor: Connect ohmmeter between both plug pins.

Nominal resistance: approx. 2.5 ... 4.5 k Ω
at approx. +15...+30°C at temperature sensor.

Eliminate open circuits, short circuits, and contact resistances in leads/plugs.

Replace evaporator-temperature sensor.



8a = Control-unit plug

9 = Evaporator-temperature sensor

9a = Plug at evaporator-temperature sensor



Test step: 7.1

Only on vehicles with air conditioning

Operation:

Rotary-switch position (S1): 2

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation of vehicle:

A/C switch at "air conditioner" position.

Turn blower switch back to position 1.

Engine running.

Additional operation:

Press button (T) on test adapter

Reading on test adapter:

Slowly falling. (Test by feel if incoming air is greatly cooled down)

Subject of testing:

Compressor coupling

Change in resistance of temperature sensor at evaporator

Reading slowly dropping?
Incoming air cooled down?

yes

Continued on next page

no

Trouble-shooting:

Check refrigerant level.

Observe safety precautions when working with refrigerant.

Press button "T" on test adapter several times, compressor coupling should engage audibly = electrically OK. If not:

Trouble-shooting with multimeter:

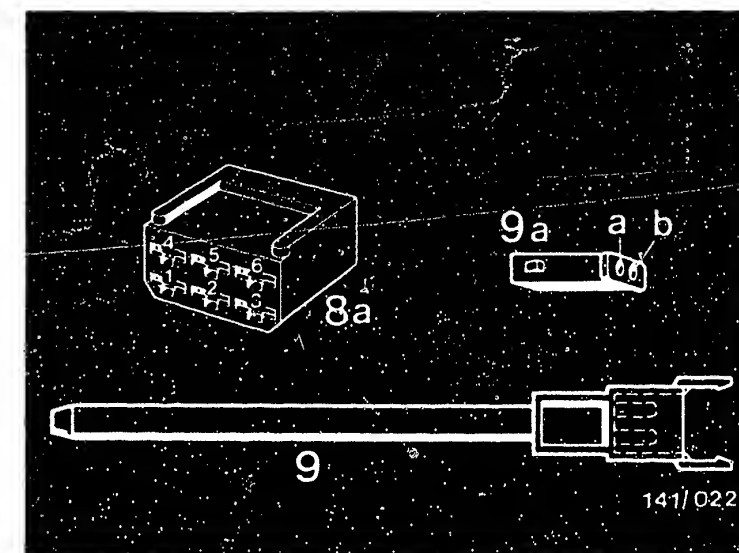
Using voltmeter, test supply voltage for compressor coupling:

From control-unit plug (8a) socket 5 via refrigerant-compressor pressure switch to compressor coupling

Nominal reading: approx. battery voltage

If battery voltage present at compressor coupling, coupling is defective.

If not, check pressure switch for continuity.



8a = Control-unit plug

9 = Evaporator-temperature sensor

9a = Plug for evaporator-temperature sensor

C10

Trouble-shooting

BMW



C11

Trouble-shooting

BMW



Test step: 8

Only on vehicles with air conditioning

Operation:

Rotary-switch position (S1): 3

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

Turn rotary temperature switch slowly from left to right.
Engine running.

Reading on test adapter

Approx. 0 ... 7

Min. approx. 0

Max. approx. 7

Reading must change between "min." and "max." evenly.

Additional operation:

Subject of testing:

Rotary temperature switch

Does reading change evenly?

yes

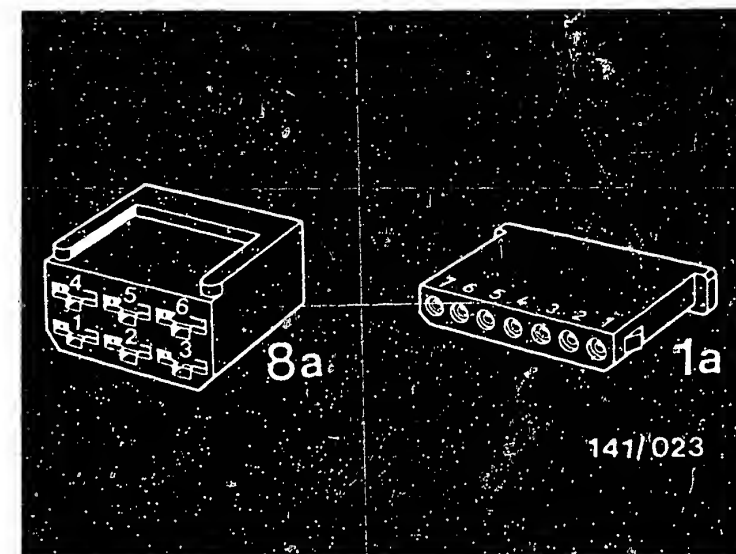
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no

Trouble-shooting

If reading moves between "min." and "max." in jumps = control unit for heating control is defective; replace.

If there is no reading, check lead from control-unit plug (1a) socket 5 to control-unit plug (8a) socket 4 for short and open circuits.



1a = Control-unit plug, heating control

8a = Control-unit plug, air conditioner

